



ENTERPRISE
INTEGRATION
GROUP

BRUCE VALENTINE
Chief Scientist and EVP

Summary Mr. Valentine has twenty years experience in design and development of speech, audio, and multimodal user interfaces. He provides research and interface design consulting services for EIG customers world-wide. He previously held key positions with Voice Control Systems, Scott Instruments, and Future Computing. His expertise includes design for telecommunications, desktop multimedia, entertainment, language training, medical, and home automation applications. He earned his Master's Degree from the University of North Texas. He is the co-author of *How to Build a Speech Recognition Application*, the best-selling book on speech design. He is also author of *The Good Listener Cookbook*, and many other articles and publications related to spoken user interfaces.

Human Interface Design Record

Speech-Only Input and Output

**Call-Processing
and IVR**

Designed several *speech-enabled voicemail* systems. Variants include fully speech-driven, speech with DTMF fallback, touch-to-talk and modal voice/keypress designs. 1997 – 1998

Designed *VoiceScreen™*, a transparent speech-to-DTMF interface that serves as a front-end to existing IVR or voice mail products. The device is designed to ignore extraneous speech and supports hands-free operation of any remote DTMF-driven application without requiring modification of the remote system. 1994

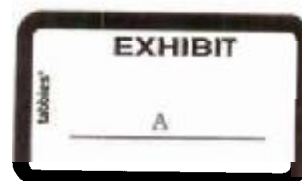
Designed *GoodListener®*, a generic user interface toolkit for speech-only dialogues. The product—aimed at IVR, voice mail and call-processing applications—features robust performance in the face of ambiguous user behaviors and variable background conditions. The self-correcting interactions support digit-string collection, natural-word menu selection and yes/no question dialogues. 1989 – 1990, 1992

**IVR, In-Car, Desktop or
Hand-Held (Embedded)**

Designed several *Voice-Activated Dialing (VAD)* applications for discrete and continuous speech. VAD applications take advantage of both speaker-dependent and -independent speech recognition technologies. 1993 – 1995, 1997 – 1998

Designed the *Sliding Capture Window*, a software device that manages turn-taking between human and computer by adjusting itself dynamically to user speech rhythms. The device provides a *Speech Button*, applicable to telephone, computer and PDA products. 1993, 1996

Designed the *Voice Scroller*, a software device that allows users to navigate forward or backward by voice through audio messages of any length. The design is applicable to voice mail, e-mail, voice notes and proofreading solutions. 1993



Speech and Graphics

Windows, GUI and Multimedia

Defined rules and methods for phonetic transcription using *WordBuilder™*, a software tool developed by Voice Control Systems, Inc. The procedures—subsequently published by VCS in handbook form—allow developers without speech expertise to create and test phonetic vocabularies. 1997

Designed a general-purpose multimodal interface that allows users to point at sound objects while talking to interactive speech applets within a WIMP or GUI environment. 1992, 1994

Designed the user interface for *Aria® Listener*, a Windows-based voice navigation software product developed for Sierra Semiconductor. The product maps speech onto Windows events to provide "speech macros," as well as supporting user-customized playback of MIDI or WAV files for audio feedback. 1992

Designed and managed the development of *Multilingua™*, an object-oriented multimedia authoring system for Macintosh-based language instruction. 1986 – 1987

Designed and managed the development of *The Speech Program*, a Macintosh-based tool with a simple WIMP interface for creating and testing both speaker dependent vocabularies and compressed speech recordings. 1986

DOS and Graphics

Assisted in the design and managed the development of the *Coretechs® Vocabulary Development System* (VDS). The DOS-based product includes a full-featured audio editor, speech recognition developer tools and both graphical and audio development and testing utilities. The toolkit allows customers to create custom multilingual speaker-independent speech recognition vocabularies. 1989 – 1991

Designed pop-up window and color-highlighting devices for the *Speech Communication Manager*, a DOS-based tool for interactive development and testing of speaker-independent speech recognition vocabularies. 1988 – 1989

Assisted in the design of a two-hour spoken-drill CBT system that taught radio communication protocols to Army tank commanders and other soldiers. Wrote the interface code in the Ten-CORE authoring language to support speech input and output. 1988

Designed several interactive demonstrations and proof-of-concept prototypes that exploited speech, color, music, sound effects (e.g. earcons) and other media to determine potential applicability to target markets including computer games, industrial data collection, telephony interaction and PDT/PDA products. 1988 – 1993

Mixed Modalities and Intermedia

Visual, Auditory, and Mechanical

Designed the human interface for HANC™, a home nursing health care robot. The machine interacts in a quasi-conversational manner with home-bound patients. Buttons adjacent to the video display operate in concert with speech, presenting parallel modalities for patient interaction. The robot measures vital signs, dispenses medication, logs user symptoms and engages in similar healthcare activities. 1988 – 1989, 1993 – 1995

Assisted in the design and managed the development of *Composer™*, a Windows 95 control system for automated lighting. The software provides interactive real-time control of focus, intensity, color and beam parameters of one or more automated luminaires. 1995, 1996

Designed a complete "intelligent home" human interface. Media include light-pen selection from a graphical display, speech synthesis, remote telephone access (DTMF) and resident-tracking through motion detection. 1985, 1986

Non-Computer Media

Developed photographic and masking techniques for 3-dimensional slide projection. Designed methods for controlling multi-channel sound within a defined space-time. Created apparatus and procedures for integrating audio and projectual media. 1973 – 1983

Designed and built the mechanical interface for several analog synthesizers and lighting controllers. The instruments enabled both studio design and live performance of multimedia concerts, intermedia productions and studies of human perception. 1972 – 1978

Employment History

**Present
July 2000**

Vice President – Speech Technologies Merged with Enterprise Integration Group, forming EIG Labs, focused on user interface design, usability research and testing.

**July 2000
July 1995**

Design Consultant – Same Page Design Group, Denton, TX—a sole proprietorship providing user interface design, human factors analysis, demonstration, presentation and related consulting services.

**July 1995
March 1986**

**Director of Product Marketing
Manager, Applications Development**

Voice Control Systems, Dallas, Texas
Scott Instruments Corporation, Denton, Texas

Scott Instruments merged with VCS Industries in 1994. The combined entity—recently acquired by Philips Speech Processing.—develops speech recognition technology.

**March 1986
November 1983**

Applications Consultant

Project-oriented contracts and employment. Clients included:

Intellisys Corporation, Richardson, Texas—a startup focused on home automation.

Expert Systems Solutions, Las Colinas, Texas—a consultation firm focused on intelligent office automation and systems administration for DOS, UNIX and MVS environments.

The Systems Center, Irving, Texas—a telecommunications software company providing high-speed data transfer between PCs on a LAN and VTAM applications on an MVS host.

November 1983
February 1982

Lab Engineer and Media Coordinator

Future Computing, Richardson, Texas

Future Computing is a high technology market research and consultation firm established by Dr. Portia Isaacson. Engineering activities included alpha, beta, usability and compatibility testing of new products, including IBM PC, Lotus 123 and Compaq portable computer. Media activities included audio, video and 35mm slide materials for sales presentations, seminars and training programs.

February 1982
August 1971

Early Career: Multimedia Production

10-year career in the fine arts and entertainment industry. Extensive theoretical and applied work in multimedia and related fields. Details available upon request.

- As composer and producer, presented numerous multimedia events worldwide.
- As studio director, coordinated audio engineering, custom recording, experiments in perceptual psychology, and seminar projects.
- As teacher, gave classroom instruction and organized field trips.

Education

1975

Master of Music (Composition), University of North Texas
Principal work was in intermedia, perceptual studies, computer composition.

1971

Bachelor of Music (Composition), cum laude, University of North Texas
Principal work was in electronic music, analog and digital synthesis

Documentation and Publication Record

Publications

"How to Build a Speech Recognition Application," with David Morgan, EIG Press, April 1999, 2nd Edition 2002.

"A Practical Guide to Phonetic Recognition," Voice Control Systems, Inc., September, 1997.

"Debouncing the Speech Button: A Sliding Capture Window Device for Synchronizing Turn-Taking," with Ayer, Colin M., Miller, Clint L., and Scott, B.L.; International Journal of Speech Technology; Volume 2, April 1997.

"A Multimedia Interface: Speech, Sound, Sight and Touch," AVIOS '94 Proceedings, American Voice Input/Output Society, September 1994.

"GoodListener[®] Cookbook, Human Interface Guidelines for Speech-Driven Applications," Scott Instruments Corporation, July 1992.

"Goal Orientation and Adaptivity in a Spoken Human Interface," with Scott, B.L., Journal of the American Voice Input/Output Society, Volume 11, February 1992.

"Reducing the Distinction between Speaker Dependence and Speaker Independence," with

Scott, B.L., *Proceedings IEEE MidCon '90*, September 1990.

"Field-Trainable unit teaches soldiers to communicate," *International Voice Systems Review*; January/February 1989.

Diagrams for "Portia's perfect pad: superhigh-tech," article by Tekla S. Perry for "*IEEE Spectrum*, Special issue: At home with high technology," May 1985.

Design Documents

GoodListener™ Detailed Specification and Design, Version 1.00; Scott Instruments Corporation, May, 1990; 70 pages, with state-transition diagrams.

IRIDEON™ Controller Windows Software, User Interface Design, Version 0.10; Vari-Lite, Incorporated, September, 1995; 95 pages, with illustrations and pseudocode.

Behavioral Definition and Human Interface Design for an Enhanced Voice Dialer, Preliminary Specification, Version 0.11; Scott Instruments Corporation, September, 1993; 52 pages, with illustrations and pseudocode.

Human Interface Design for an Enhanced Voice Dialer, Detailed Design Version 1.00; Scott Instruments Corporation, December, 1993; 44 pages, with graphic illustrations, state-transition diagrams and flowcharts.

VoiceScreen™ Front End, Preliminary Specification Version 0.01; Voice Control Systems, March, 1994; 14 pages, with graphic illustrations and state-transition diagrams.

Human Interface Design for an Enhanced Voice Dialer, Detailed Design Version 2.00; Scott Instruments Corporation, June, 1994; 67 pages, with state-transition diagrams and flowcharts.

FutureHome™ Home Control Design Document; Intellisys, Inc., November, 1985; 90 pages.

Miscellaneous

Coretechs® Signal Processor: Correlator, Basic Concepts and Definitions; August, 1987; *Extended Coretechs®* Technology Presentation; Scott Instruments Corporation; October, 1987; 19 pages with detailed illustrations, pseudocode and overhead viewgraphs.

Coretechs® Speech Recognition Firmware Port Overview; Scott Instruments Corporation; October, 1991; 13 pages with diagrams, memory maps and resource-estimate formulas.

The Road Less Traveled instructional and promotional videotape; Scott Instruments Corporation; November, 1990; 37 minutes with animated illustrations, user interface display close-ups and hardware product demonstration.

VET 3 Industrial Application Guidelines; Scott Instruments Corporation; October, 1987; 45 pages with illustrations, worksheets and overhead viewgraphs.

"A Voltage-Controlled Incandescent Lamp Driver for Musical Performances of Multimedia Works," Master's Thesis, University of North Texas, August 1975; 76 pages with illustrations, schematics and photographs.

Industry Recognition and Involvement

Awards

Served as principle designer for the VCS Voice Dialer 2060. The product earned the HAA Mark of Excellence 1995 User Friendly Hardware Award, co-sponsored by the Home Automation Association and Electronic House.

Served as principle designer for the IRIDEON™ *Composer*™ Windows 95 PC Software product. The IRIDEON AR5® automated luminaire and its associated *Composer* control system earned the LightFair 1996 Product of the Year award, May, 1996.

Co-inventor, U.S. Patent #5,025,471, *Method and Apparatus for Extracting Information-Bearing Portions of a Signal for Recognizing Varying Instances of Similar Patterns*, awarded June 18, 1991.

Professional Invitations

In response to an invitation by the Human Factors and Ergonomics Society (HFES) Communications Technical Group (CTG), presented *Speech Technology in Its Own Right—Shedding the Baggage of the Past* as Featured Speaker for the 41st Annual Meeting in Albuquerque, New Mexico, September, 1997.

Invited to appear before General Maxwell Thurman and top-level Army commanders as representative spokesman for the speech industry to present *The Current State of Speech Recognition Technology* at the TRADOC Commander's Conference, Fort Leavenworth, Kansas, March, 1989.

Invited to serve as Technical Advisor to the ANSI/HFES 200 committee for human-computer interaction standards, 1994–1997.

Invited to speak at numerous conferences and trade shows, including annual meetings of the American Voice Input/Output Society (AVIOS), SpeechTech, Voice (now sponsored by Advanstar), MidCon and VoicePower.

Seminars and Presentations

Co-presenter of Enterprise Integration Group's *Improving the Effectiveness of IVR and Voice Portals* seminar, held several times per year from 1999 to present.

Under sponsorship by Voice Control Systems, presented a series of seminars in the U.S. and Europe on *Human Factors and Voice Recognition*, 1996 – 1998.

Presented in-depth professional seminars on GoodListener® human interface design methods in London, New York and Toronto.

Provided formal classroom instruction on various technical subjects to the Federal Aviation Administration (FAA), Harris/Lanier, IBM, Microsoft, the National Security Agency (NSA), Northern Telecom, ProDentec, Sierra Semiconductor, Silicon Graphics, Sun Microsystems and others.

Gave major presentations on theory, technology, or products to clients on-site in Cologne, Edinburgh, Graz, Lisbon, Manchester, Nice (La Gaude), Osaka, Paris and Tokyo, as well as various cities in the United States.

Memberships

Member ACM and CHI special interest group. Member IEEE.